

PATENT SPECIFICATION

596,715



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COMPLETE SPECIFICATION

Method and Means for Tubing Wells

I, PIERRE JEAN-MARIE THEODORE ALLARD, a Citizen of the French Republic, of 23, Avenue de Joinville, Chantilly (Oise), France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

10 Tubing of wells is generally carried out by means of thick steel tube elements connected together by means of screwed or rivetted flanges.

15 Sinking of the tubes being produced by pressure or by percussion, said tubes must be very strong.

It has already been proposed to impart to the tubes continuous or reciprocating rotary motion, so as to permit sinking of the tubes without substantial pressure or percussion, and to thus reduce to a very large extent the wall thickness of the tubes.

25 I take advantage of the small thickness of these tubes by shaping them on the spot and the present invention has for its object to devise a method for tubing wells and an apparatus for carrying said method into practice.

30 According to the invention, the sinking tubes are constituted by thin sheet iron plates rolled and welded on the spot along a generatrix line, each tube element being placed in operative position as sinking progresses, and the junction of the tube element being also carried out by welding.

35 Owing to this method, an integral tubing is obtained, without any projecting flanges or other connecting means, whereby sinking of the tubing into the wall is considerably facilitated.

40 Connection of the tube elements by welding does away with the difficulty of sinking a tubing made up of screwed elements by a reciprocating rotary motion.

Furthermore, the tube elements may be made from plane iron sheets, which require very little space and may be readily transported on a lorry or a truck, 50 contrary to ordinary well sinking tubes, which require a considerable space.

For carrying said method into practice, use is preferably made of a travelling

plant embodying on a carriage the various devices necessary for making the tubes and the gear for imparting to the tubes a reciprocating rotary motion. 55

Further features of the invention will be apparent from the following description, with reference to the accompanying drawings, which show, by way of example, an embodiment of the invention, and in which: 60

Fig. 1 is a vertical sectional view showing a well tubing according to the invention; 65

Fig. 2 is a diagrammatic plan view showing means for imparting a reciprocating rotary motion to the tube;

70 Figs. 3 to 5 are elevational views showing a work-shop vehicle for making the tubes and performing well sinking, in different operative positions;

Fig. 6 is an enlarged end view of the workshop vehicle; 75

Fig. 7 is a corresponding elevational view.

Fig. 8 is a plan view corresponding to Fig. 7.

Fig. 1 shows at A^1 , A^2 , A^3 , A^4 and Fig. 2 is a plan view of tubular elements obtained by rolling and butt-welding metal sheets along a generatrix a . The first element A^1 is welded to a serrated crown B, intended to bite into the ground under the action of the reciprocating rotation imparted to the tubing, no percussion on the top of the tubing being necessary. Elements A^2 , A^3 , A^4 are successively superposed and welded together according to the directrices b , as sinking of the tubes progresses. 80

Reciprocating rotation is imparted to the tubing by means of a lever 1 (Fig. 2), one end of which has a collar 2, adapted to be detachably secured on the uppermost tube, the other end having a fork 3 straddling over a roller 4, to which a reciprocating rectilinear movement is imparted along a runway 5, under the action of a hydraulic device hereinafter described, mounted on a frame 6. 85

In the embodiment illustrated in the drawing by way of example, roller 4 is mounted in a sliding bar 7 (Fig. 7) connected by a pin or bolt 8 to the piston 9 90

[Price 1/-]

of a double effect hydraulic ram 10 fed through the distributor of a pump 11, driven by an engine 12. Said engine also drives an electric generator 13 adapted to supply electric current to an electric arc welding plant, used for making the tubes as they are needed in the course of the sinking operation and for joining the tubes as the work progresses. The engine and the generator are covered with a hood 26.

Frame 6 also carries a bending machine 14, which may be operated by hand or by engine 12, through any suitable transmission.

Frame 6 is provided with a vertical jack 15 (Fig. 4) which is connected at its lower end with a plate 16, through a universal joint 17.

Jack 15 is adapted to raise the whole plant on frame 6 for mounting or removing a pair of rear wheels 18, which, together with front wheels 19, convert the plant into a travelling workshop.

The frame carries at one end a hollow barrel 20, adapted to accommodate a bar or lever 21 which may be used for relieving the front wheels 19 from the weight of the whole plant and for removing said wheels together with their suspension springs, after removal of a stop ring 22. The frame further comprises a number of sockets 23, adapted to receive stakes 24, for anchoring the frame in the ground, after the wheels have been removed. In addition, the frame is provided with a spade-like projection 25, adapted to be wedged in the ground and to resist the reactions of the hydraulic ram.

If necessary, the ground may be slightly dug out to receive the frame in a steady position.

The operation is as follows:—

The machine in travelling order (Fig. 3) is brought to a suitable place, adjacent the well to be sunk (Figs. 1 and 2). The frame and the whole plant are raised by means of jack 15 (Fig. 4); the rear wheels 18 are taken off and jack 15 is lowered until the frame bears on the ground through anchoring spade 25 (Fig. 5). The whole is then raised by means of lever 21, to facilitate removal of stop ring 22, which locks the two front wheels 19 and the suspension springs and steering means.

The frame then lies on the ground (Fig. 7), on which it is anchored by stakes 24, previously inserted into the respective sockets 23. Lever 1 is then mounted in place with collar 2 above the place where the well is to be sunk.

After a preliminary sinking operation, the first tube element A¹, provided at its lower end with the serrated crown B, is

fastened in collar 2 and a reciprocating rotary motion is imparted thereto by the machine. When the first element has been sunk to a suitable depth, the second element, which has been prepared in the meantime on the bending machine 14 and welded along a generatrix, is superposed to the tube element already sunk and connected thereto by the welded joint b. The operation is carried on in this way until the desired depth is reached.

It will be understood that the invention is not limited to the particular embodiment above described and shown, which has been given merely by way of example. In particular, the mechanism for rotating the tubing may be such as to impart thereto a continuous rotation always in the same direction, although a reciprocating rotation is preferable as far as the speed of sinking is concerned.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A method for tubing wells, which consists in making the tube elements on the spot by shaping thin plane sheet blanks and welding the blanks along a generatrix and assembling the tubing elements by welding, as sinking progresses.

2. A method as claimed in claim 1, wherein the integral welded tubing has imparted to it a reciprocating rotary motion, without percussion.

3. An apparatus for carrying out the method claimed in claims 1 and 2, which comprises carried by a vehicle with detachable wheels and with means for anchoring the chassis frame in the ground, a mechanism for imparting to the tubes a continuous or reciprocating rotary motion, power means for driving said mechanism, a bending machine for shaping tube elements from plane sheet blanks, and an electric generator driven by said power means for supplying electric current to a welding outfit for butt-welding the blanks along a generatrix and assembling together the superposed tube elements into an integral tubing.

4. An apparatus as claimed in claim 3, wherein the mechanism for controlling the rotation of the tubing comprises a hydraulic ram fed by a pump provided with a distributor, the pump piston being connected with a reciprocating bar provided with a roller engaged in a fork at one end of the lever having at its other end a fastening collar adapted to be secured to the top of the tubing.

5. An apparatus as claimed in claim 3,

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wherein the frame is fitted with a lifting jack and a detachable lever intended for taking off the wheels and their suspension springs.

- 5 6. An apparatus as claimed in claim 3, wherein the frame is provided with sockets adapted to receive removable anchoring stakes.

7. A process of sinking and tubing
10 wells, substantially as described.

8. An apparatus for sinking and tubing wells, substantially as described and as shown in the appended drawing.

Dated this 31st day of July, 1945.
CRUIKSHANK & FAIRWEATHER,
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Chancery Lane, London, W.C.2, and
29, St. Vincent Place, Glasgow,
Agents for the Applicant.

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[This Drawing is a reproduction of the Original on a reduced scale.]

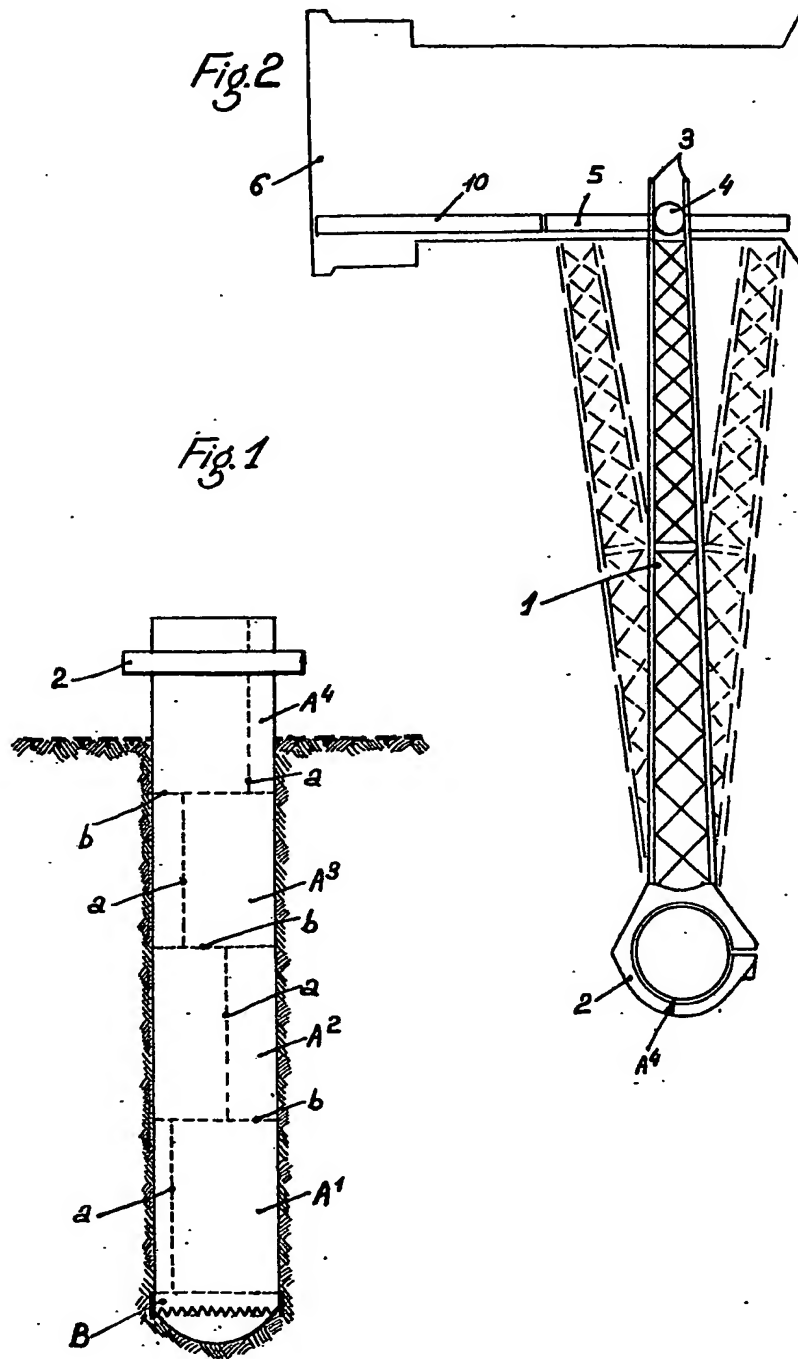


Fig. 3

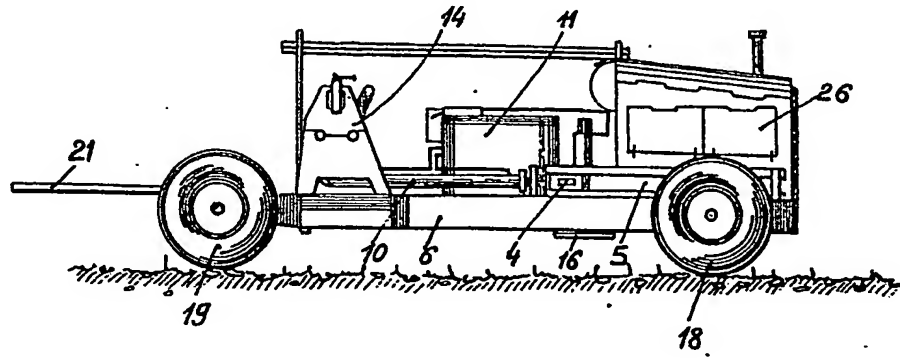
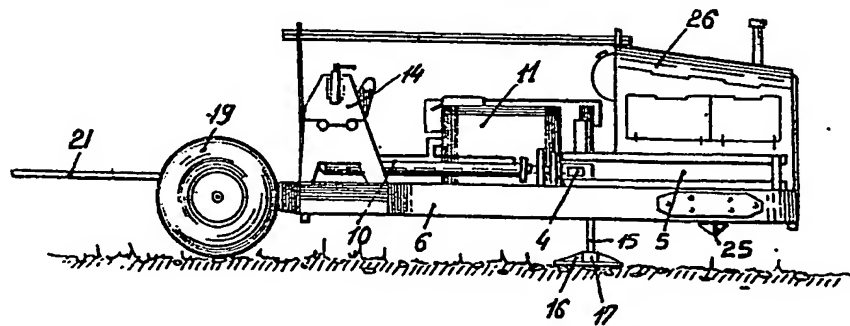


Fig. 4



[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 5

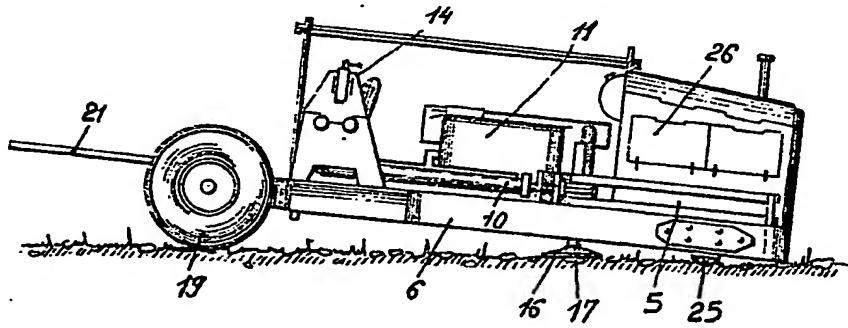


Fig. 6

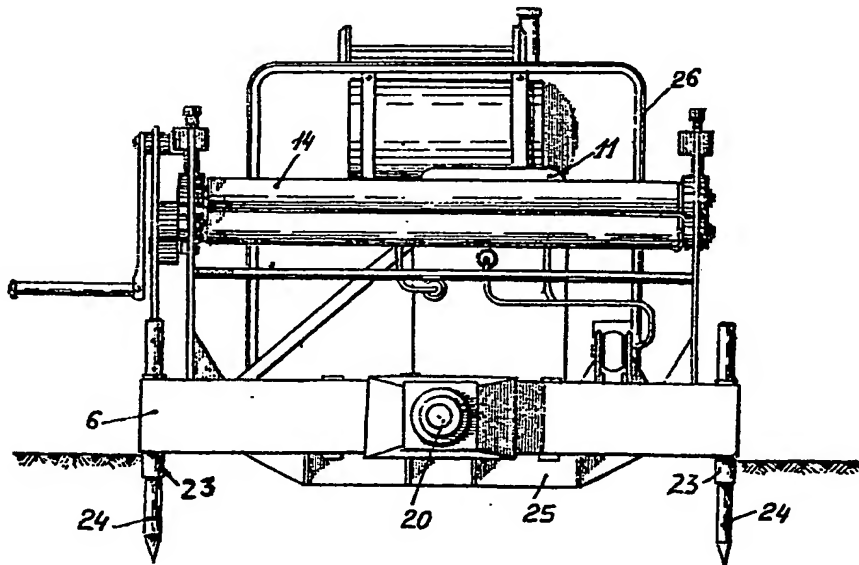


Fig. 3

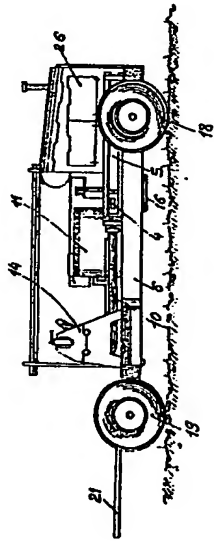


Fig. 4

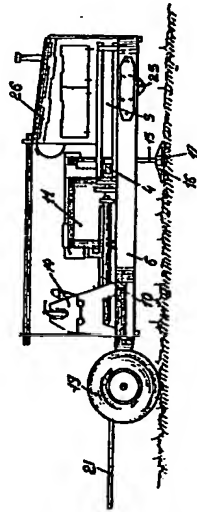


Fig. 5

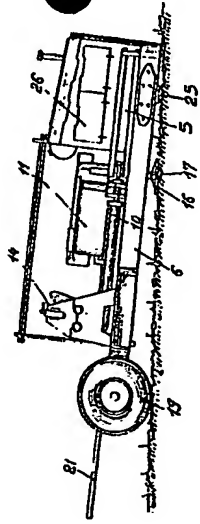
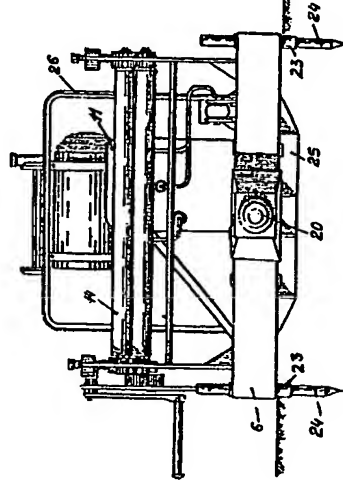


Fig. 6



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Fig. 7

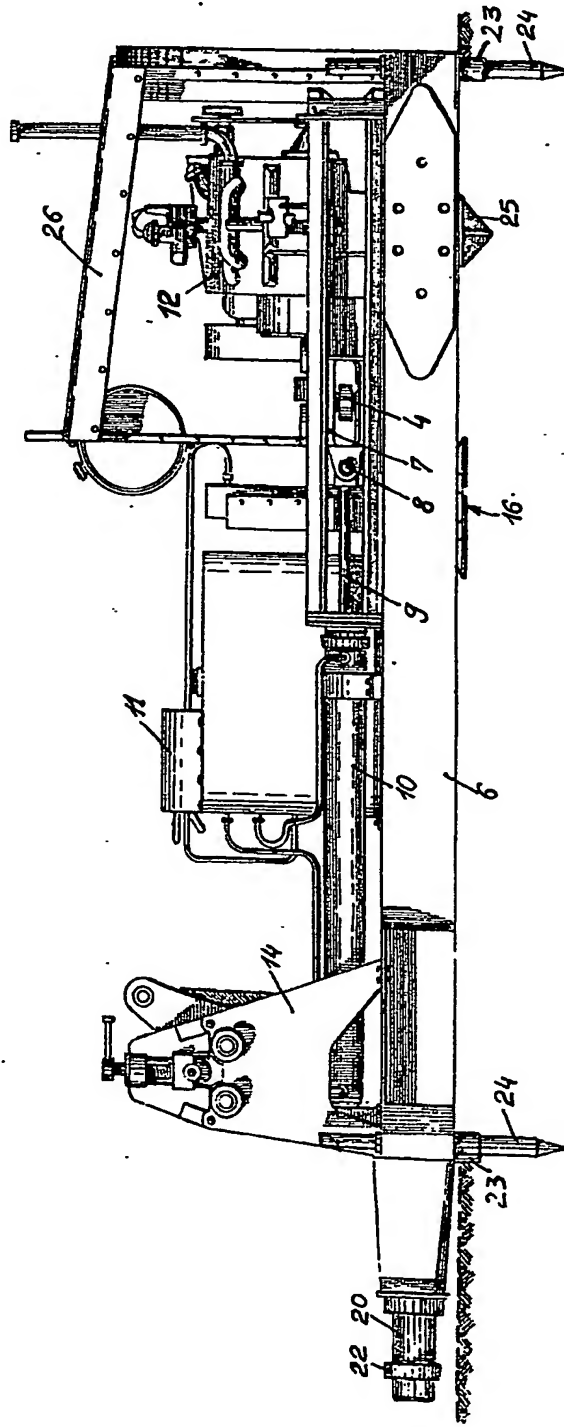
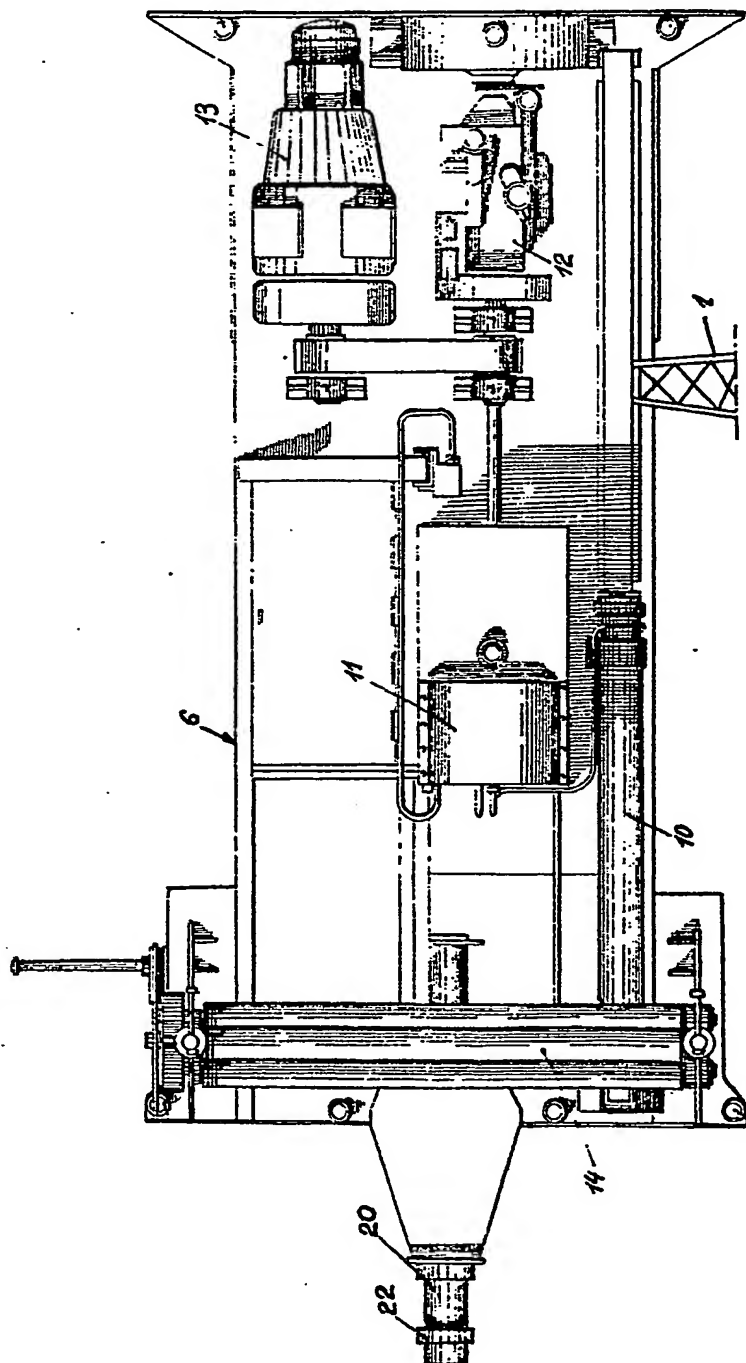
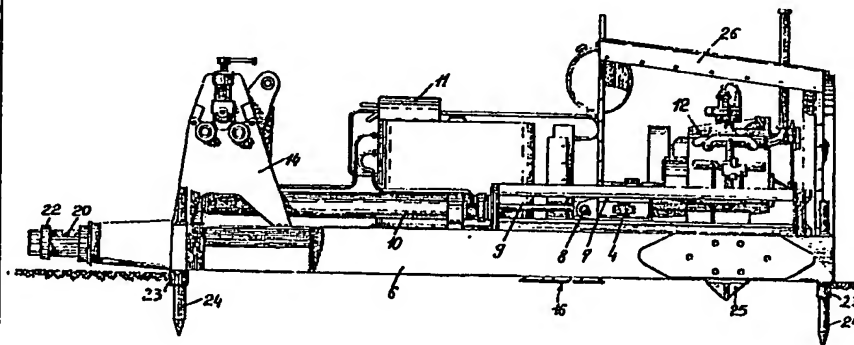


Fig. 8



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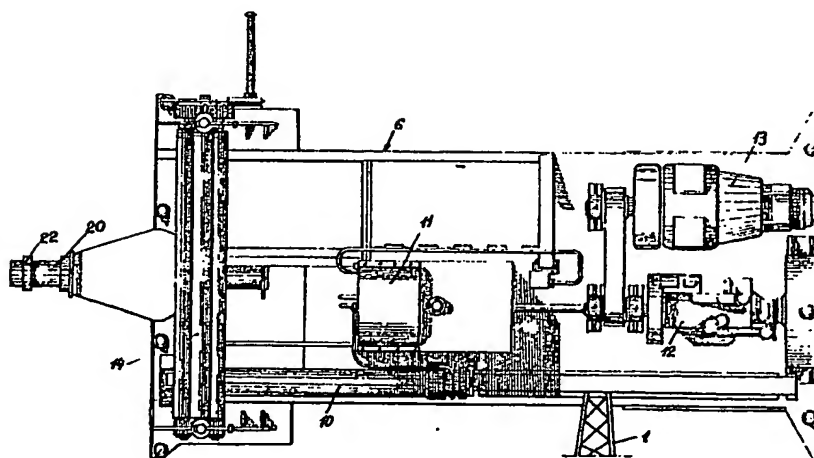
Fig. 7



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SHEET 4

Fig. 8



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SHEET 5